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No. 21

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10 January 1980

CHINA REPORT
SCIENCE AND TECHNOLOGY
No. 21
EXCERPTS FROM 'XIANDAIHUA'

Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79

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Publication of XIANDAIHUA [MODERNIZATION]]

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INTRODUCTION

Beijing XIANDIHUA [MODERNIZATION] in Chinese No 1, Mar 79 p 1

[Article by the Editorial Department of XIANDAIHUA]

[Text] Just as the emphasis of all the party and all the nation is shifting to modernization and construction of socialism, a new sprout emerges from the soil of the garden of science! This is the journal XIANDAIHUA, designed as a journal of popular science and technology to serve the Four Modernizations.

The beloved Comrade Zhou Enlai represented the Party Central Committee in his call for the realization of the Four Modernizations within this century. His proposal has become the target of struggle of our new long march. The heroes of the April 5th Movement took the solemn oath of "Struggle for the Fatherland's Four Modernizations" and their oath has become the inspiration for thousands and millions of people, all ready to devote themselves to the common effort. Today, up and down the country, there is peace and there is unity. Hearts and minds are joined to perform for the realization of the Four Modernizations. The future is like a glorious spring, a stage set for hundreds of blossoms to contest their beauty. XIANDAIHUA is born to accommodate this new situation.

During the past decade, internationally, science and technology have been marching forward at a speed of a thousand li a day, especially in such realms as nuclear energy, electronic computers, space science and technology, laser, automation, genetic engineering, etc. These sciences and technologies are exercising important functions in various aspects of human life and are causing great changes in such areas as industry, agriculture, and national defense; while in China, this has been the period of severe interference and severe destruction by Lin Biao and the "gang of four." This group of political confidence men made use of feudalism, fascism, and fraud in a crazy manner for the purpose of usurping the party and power. They stampeded through our country's lively garden of science to cause all the blossoms to wither and to leave nothing but a stark wasteland for all to see. Today, for the purpose of hastening the realization of Four Modernizations, we are required to be doubly diligent to learn science, technology, and management so as to become red and expert. The publication of XIANDAIHUA is for helping the cadres and the masses, especially the cadres, to gain

knowledge of modern science and technology and modernized management, to broaden their vision and to improve their bearing so that they can provide better service to the realization of the Four Modernizations.

Science is productivity. It is a revolutionary force, acting to propel history. Science cannot be separated from democracy. Without socialist democracy, there cannot be popular rise of the level of scientific culture of all the nationalities. Then, superstition cannot be extinguished, forbidden zones cannot be broken through, thoughts cannot be liberated, and, of course, the Four Modernizations of socialism cannot be realized. The interest of this journal lies in promoting a scientific attitude, in advocating a struggle for truth, and in teaching the ignorant through popularizing modern science, technology, and scientific management. With respect to problems of modernization, discussions shall be carried out in accordance with the policy of "let a hundred flowers bloom, a hundred schools of thought contend," to make this a democratic magazine.

Practice is the only standard to judge truth. So far as the best way of publishing XIANDAIHUA, the editors remain inexperienced. We are determined, however, to learn while working, and to work while learning, to let wisdom and talent grow with practice for continued improvement of the work. We are determined to join the authors and readers to make this a good publication, to cause this new sprout to grow and mature, and to contribute efforts toward the Four Modernizations. We sincerely hope all will support this garden and supply us with manuscripts. All will regularly provide us with criticisms and suggestions to allow the flower of the fatherland's popularization of science to bloom to its fullest for the Four Modernizations.

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NEED TO MODERNIZE SCIENTIFIC MANAGEMENT STRESSED

Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 p 3

[Article by Hua Juogeng [5478 5012 1649], Vice Chairman, People's Republic of China Science and Technology Association and Deputy Director of the Chinese Academy of Sciences: "Scientific Management Must Be Modernized"]

[Text] The new long march of our great fatherland toward socialist modernization construction has begun. Modernization of science and technology is the key to the realization of the Four Modernizations. With respect to science and technology, we need a great advancement and we also need a great popularization. The two work hand in hand and are mutually promoting. XIANDAIHUA is a comprehensive popular science journal. It should popularize modern knowledge of science and technology and should also popularize modern knowledge of management. Once modernized tools are acquired, it will not do without efficient methods of utilizing these tools. Due to the fact that modern scientific subjects are often very complex, the work involving many fields will often be mutually limiting without good organization. There will be no way to march forward and completion of an entire project on time will be affected. Through scientific management, all related links of the various aspects may be organized together for an overall planning and arrangement so as to guarantee uniformed steps to convert the fruits of scientific research quickly into productivity.

High efficiency is one the keys to the realization of the Four Modernizations. If you do not have higher efficiency than the others, if walking at a faster speed than the others or just following the others will cause you to feel very tired, how are you ever going to catch up with the others or to surpass them? In order to acquire high work efficiency, modernization of scientific management and modernization of scientific practice are extremely necessary. It is especially important [to realize] that modernization of scientific management is not very easy to implement because our country has a prolonged history of feudal rule. Feudalist consciousness of handling matters according to the will of the boss is deeply rooted. The force of habit of small scale production remains powerful. At present, the phenomenon of "relying upon what is in the head" to direct production still exists everywhere. If the Four Modernizations are to be realized it is absolutely necessary to adopt scientific management. Today, there remain

a large number of people who do not regard management as a science and who seem to think anybody can carry out management. They do not know that in the past decade or two, management science has been developing very rapidly in foreign countries, especially in combination with the application of computers. This advancement has had a very important function in modernization of management and in high speed development of production.

Learning management is a new job and a new subject for us to face. Learning scientific management is more difficult than learning a particular science and technology. It requires theories of scientific management as well as a vast knowledge of science and technology. Furthermore, a rich experience of practice is also needed to understand our own past and the present condition. It is necessary to learn the advanced experience of scientific management in foreign countries and it is also necessary to digest what we learn and practice in our own hard work, otherwise, "utilizing what is foreign for the Chinese" would just be an empty phrase. Popularizing management science is for the service of the masses and the cadres so that they can learn management.

In the past ten plus years, from my own participation in the practice of overall planning and selective extension, I have felt very deeply that if ever the scientific method is mastered by the millions of masses so that they will be able to apply it, the power is indeed beyond imagination. Overall planning is one of the modernized scientific management methods and selective extension is one of the modernized scientific practice methods. When these methods are applied, the level of management may be raised to develop the potential for production increase without increasing capital investment, equipment, or the number of personnel. For example, the administrators of Kouquan Station of Datong, Shanxi adopted the overall planning method to improve their train dispatching system. Instead of transporting 700 cars of coal a day, they have been able to transport 1000 cars to surpass the best level in history. When scientific methods are used to organize production to replace the "what is in the head" style, the urgent needs of today may be met by reliance upon experience. The overall planning and selective extension methods are being emphasized and welcomed in more than twenty provinces, cities, and autonomous regions. This fact reflects the urgent need of the masses and the cadres for knowledge of modernized scientific management and scientific practice.

Popularization of scientific knowledge can inspire a passion for learning in the masses and the cadres to raise the level of their scientific culture so that they will present new demands from those who work for the popularization of sciences. Whatever is in need of popularization, we, who work for popularization of sciences must learn it first and study it first. After learning and studying, we can know for certain those that are worthy of popularizing. I hope, in the process of popularizing science and technology, XIANDAIHUA will also popularize knowledge of scientific management, and I hope those of the editorial department will emphasize this aspect of learning.

ABSTRACTS

AUTHOR: None

ORG: Reporter of the Journal

TITLE: "Modernized Agriculture of the United States"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 4-8

ABSTRACT: This paper is a report of the Chinese Agricultural delegation to the United States. The date of the visit is not given. Aside from various statistics on American agriculture, the paper describes the state of agriculture in the United States in sections titled: a high degree of total mechanization; application of a complete set of modernized scientific techniques in agriculture; regionalization, specialization, and socialization; emphasis on protection of natural resources and unity of agriculture, forestry, and animal husbandry; attention to the work of education and research and the work of extending techniques of agriculture.

AUTHOR: LOU Chenghou [1236 2052 0683]

ORG: North China University of Agriculture

TITLE: "No-Flowing Technique"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 p 8

ABSTRACT: In traditional Chinese agriculture, careful plowing is credited for loosening the soil, preserving the moisture, extinguishing weeds, invigorating sprouts, ventilating the soil, supplementing fertility, preventing chills, maintaining warmth, and regulating growth, but in the viewpoint of modern agricultural technology, traditional plowing has disadvantages as well. Prolonged plowing may damage soil structure, which in turn may reduce soil fertility to create other problems. This paper describes the technique of doing away with plowing, which has been introduced in the past five decades. Historically speaking, the no-plowing technique of farming has been in practice in Central Gansu for more than two hundred years. The technique in use in the sandy lands of that province and the modern no-plowing technique are both briefly commented on.

AUTHOR: DONG Mingliang [5516 2494 0081]

ORG: State's General Bureau of Agriculture and Land Reclamation

TITLE: "An Overture of China's Agricultural Modernization: the Second Team of the Fifth Branch of Friendship Farm"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 9-11

ABSTRACT: Good news has arrived from the Second Team of the Fifth Branch of Friendship Farm of Heilongjiang Province. Since the fall of 1978, the team has used the newly introduced modern machinery of the United States to create the highest labor productivity in the history of Chinese agriculture. Each worker averaged nearly one thousand mu to produce an annual yield of two hundred catties of grain and beans and five thousand nine hundred catties of rape seeds. Details of farming practices of that team are described.

AUTHOR: QIU Meizhen [6726 2734 6297]

ORG: Editorial Department of the Journal, NONGYE JIYE [AGRICULTURAL MACHINERY]

TITLE: "Two and One Half Persons Produced One Million Chickens in One Year-- A Report of the Chicken Farm of an American Farmer, Mr. Brooke"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 12-13

ABSTRACT: This paper is a report of a chicken farm belonging to Mr Brooke of California by the author and colleagues. Mr Brooke and his two sons, with their machines, perform all the labor required on the chicken farm, which produces one million meat chickens a year. The elder son who attends classes at a university as well, can, therefore, work only half the time. Aside from a description of the farm, some photos and drawings of the chicken plant, some statistical data on chicken and egg production of the United States are also given.

AUTHOR: CHEN Zongzong [7115 1350 1350]

ORG: Qinghua University

TITLE: "Crossing Over in the Air: Japan's MV-PP15 Air-Cushion Boat
(An Explanation of the Front Cover)"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 p 15

ABSTRACT: During his visit to Japan last year, Comrade DENG Xiaoping was invited to tour the new Junjin Steel Mill. Comrade DENG and his group boarded an MV-PP 15 air-cushion vessel in Tokyo Bay and sped away at 75 km per hour to reach the destination in 45 minutes. A color drawing of the vessel serves as the front cover of this issue of the journal. A description of the air-cushion craft is given in this paper.

AUTHOR: (1) DING Yuanxi [0002 0337 3556]
(2) BAI Yiran [4101 1837 3544]
(3) KE Song [2688 2646]
(4) KE Song
(5) BAI Yiran

ORG: None

TITLE: "Brief News of Modernization"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 16-17, 32

ABSTRACT: Five short items are included in the paper: (1) Highest Pressure in the World Produced by Man: A most recent experimental success in the Carnegie Institute of the United States is described in a Japanese magazine article and translated by the author. (2) Laser Acupuncture: An article in POPULAR SCIENCE of the United States, translated by the author; (3) Large Reverse Osmosis Desalination Plant Under Construction: Translation of an article in "Internal Research" 5 July 1978; (4) High Differentiation Scanning Type Sonic Microscope: Translation of an article in "Internal Research" 5 July 1978; (5) Tower Style Greenhouse: Translation of an article in POPULAR SCIENCE of the United States, Vol 212 No 6.

AUTHOR: ZHANG Xiu [1728 0208]

ORG: Institute of Computer Technology, Chinese Academy of Sciences

TITLE: " 1.5×10^8 Times/Second: ILLIAC-IV, the Champion Fast Computer of the World"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 18-20

ABSTRACT: Dr. D.L. Slotnick of the Department of Computer Science of the University of Illinois had been in charge of designing the computer since 1966 and the design formula was completed in 1968. The estimated cost was fourteen million dollars but by the time one fourth of the original design was built, twenty-eight million had already been spent. This is the ILLIAC-IV. Properties of this experimental computer are described. There are also two photos depicting the appearance of the computer.

AUTHOR: CHEN Ming [7115 2494]

ORG: None

TITLE: "Planetary Universe Observed From a Spacecraft"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 21-24

ABSTRACT: Information concerning the planetary universe gained by the United States unmanned spacecraft of the Pioneer, the Mariner, and the Viking series is briefly discussed. Photos of Jupiter, Mercury, Venus, and Mars taken by these spacecraft are reproduced to serve as a part of the centerfold of this issue of the journal.

AUTHOR: KE Song 2688 2646]

ORG: None

TITLE: "The Mystifying Black Hole"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 29-32

ABSTRACT: This paper is a translated excerpt of an article on the subject matter of the black hole appearing in TIME MAGAZINE of the United States, on 4 Sep 1978.

AUTHOR: CHEN Houyun [7115 0624 0061]

ORG: Institute of Computer Technology, Chinese Academy of Sciences

TITLE: "Generations of Electronic Computers"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 33-36

ABSTRACT: Although the birth of the first electronic computer of the world was only 33 years ago, there have since been three generations of changes in electronic computers. The first generation computers were built of components made of electron tubes; the second generation used transistors, and the third generation consists of integrated circuit computers. At present, computers are in a transition toward the fourth generation, which is large scale integrated circuit computers. The history of development of electronic computers is briefly narrated in the paper.

AUTHOR: FANG Yongsui [2455 3057 4840]
XU Yongchao [1776 3057 6389]

ORG: FANG of Institute of Electronics, Chinese Academy of Sciences; XU of Institute of Application and Extension of Electronic Technology, the Fourth Ministry of Machine Industry

TITLE: "Talks on System Engineering (1): System Engineering, A Basic Science Closely Related to Modernization"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 37-40

ABSTRACT: System engineering means the use of modern mathematical methods and tools to study, analyze, plan, design, organize, manage, and evaluate a given system and its related problems. The system may be a watch, a radio receiver, a television receiver, a hospital, a harbor, a man, a football team, a store, a power station, etc. A country's industry or agriculture may also each be a system, while an entire nation or the whole world may also be regarded as a system. This paper describes briefly the field and its close relationship with the Four Modernizations.

AUTHOR: CHEN Weili [7115 0251 0500]

ORG: Institute of Physics, Chinese Academy of Sciences

TITLE: "Radar Deception--Speaking of Microwave Absorption Materials"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 40-42

ABSTRACT: Research studies on microwave absorption materials have had a history of nearly fifty years. The first microwave absorption material was made by a Frenchman in 1936. It was largely a synchronizing type of material to absorb through resonance a narrow frequency band. Since the late 1950's, materials capable of absorbing a wider frequency band have been created in the United States, West Germany, and Japan. Most recently, a nickel-zinc iron oxide material was announced by the United States. Research and production of microwave absorption materials began in China in the 1960's, and some of the products have reached the international level. The theory of microwave absorption, which interferes with radar detection, and its application in modern national defense are explained.

AUTHOR: YUAN Zuqi [7086 4371 0796]

ORG: None

TITLE: "Prospect of Modernization: Future Solar Energy Power Stations in Space"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 43-45

ABSTRACT: This paper consists of translated excerpts from articles on the subject of possible space solar energy power stations appearing in the magazine PHYSICS TODAY No 2, 1977 of the United States and the magazine "Technical Survey and Drawing" No 2, 1975 of West Germany.

AUTHOR: HUANG Liangfu [7806 5328 6534]

ORG: Division of Electrical Appliances for Home Use, Bureau of Hardwares, Ministry of Light Industry

TITLE: "Helping Hands in Modern Living--Home Electrical Appliance"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 46-49

ABSTRACT: In countries with highly developed science and technology, there are all sorts of apparatuses to provide fresh air, to wash and iron clothes, to prepare beverages and meals, to clean the house, to drive away the mosquitoes, to wash the dishes, etc. automatically so that more time and effort may be devoted to educating one's children and to cultural endeavors. For this reason, the development of home electrical appliances is a matter closely related to the entire national economy and the lives of the people. In separate sections, the structure and application of the washing machine, the air conditioner, the dishwasher, the refrigerator, and the microwave oven are described. There are also drawings depicting the appearance and the structure of these home appliances.

AUTHOR: DING Yuanxi [0002 0337 3556]

ORG: None

TITLE: "Is Nuclear Energy Power Generation More Dangerous Than Power Generation by Wind and Solar Energy?"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 p 49

ABSTRACT: Since the occurrence of the petroleum crisis, many countries have devoted a great deal of effort to search for substitute energy sources. Aside from nuclear energy, forms of power generation with wind, solar energy, and geothermal energy have all been actually adopted in one place or another. Most recently, a research report was published by the Canadian Bureau of Nuclear Energy Management stating that the use of wind and solar energy to generate electricity is much more dangerous than power generation with nuclear energy. When mining, transportation, machine manufacturing, etc. are included in the process of producing unit power, i.e. kilowatt/year, the data of various risks of death, injury, and diseases are computed in terms of man/day losses by the bureau. They indicate that of the ten forms of power generation, the danger is the least with natural gas, only about a 6 man/day, and nuclear energy is the next least dangerous, about 10 man/day. The danger of using temperature differential of sea water to generate electricity is about 25 man/day, and the most dangerous form of power generation is coal, amounting to three thousand man/day.

AUTHOR: (1) JIN Liangjun [6855 5328 3182]
(2) WANG Xingcheng [3769 5281 2052]
(3) WEI Mai [7614 6701]

ORG: (1) Academy of Construction Science; (2) Chinese Academy of Social Sciences; (3) Institute of Technological Information, Chinese Academy of Sciences

TITLE: "Modernization Mailbox"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese No 1, Mar 79 pp 50-51

ABSTRACT: This paper includes three short items on answers of three authors to [presumably] questions by the readers on the following subjects: (1) What is scienceology; (2) What sort of thing is futurology; (3) What is organic agriculture?.

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